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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,651	01/20/2004	Gregory Edward Tierney	200313615-1	9869
22879	7590	05/19/2006		
HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400			EXAMINER PHAN, RAYMOND NGAN	
			ART UNIT	PAPER NUMBER
			2111	

DATE MAILED: 05/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/760,651	Applicant(s) TIERNEY ET AL.	
	Examiner Raymond Phan	Art Unit 2111	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19-24 is/are allowed.
- 6) ☒ Claim(s) 1-3, 8-12, 16, 17, 25 and 29-34 is/are rejected.
- 7) ☒ Claim(s) 4-7, 13-15, 18, 26-28 and 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>02/2006 3-2-2006</u> | 6) <input type="checkbox"/> Other: _____ |

Part III DETAILED ACTION

Notice to Applicant(s)

1. This action is responsive to the following communications: amendment and remarks filed on March 13, 2006.
2. This application has been examined. Claims 1-35 are pending.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

5. Claims 1, 8-12, 16-17, 25, 29-34 are rejected under 35 U.S.C. § 102(e) as being anticipated by Cypher (US No. 6,877,056).

In regard to claims 1, 25, Cypher discloses a system comprising: a home node that receives a first request for data from a first node according to a first cache coherency protocol (i.e. directory-based coherency protocol) (see col. 21, lines 20-60) and provides a second request for the data based on the first request

(see col. 20, lines 20-60); a second node that provides a conflict response to the second request, the conflict response indicating that an ordering point for the data is migrating according to a second cache coherency protocol (i.e. broadcast-based coherency protocol), which is different from the first cache coherency protocol (see col. 18, lines 32-64).

In regard to claims 8-9, 16, 30, Cypher discloses wherein the first cache coherency protocol comprises a forward progress cache coherency protocol (i.e. directory-based protocol) (see col. 21, lines 20-60).

In regard to claims 10, 29, Cypher discloses wherein the second cache coherency protocol comprises a source broadcast cache coherency protocol (i.e. broadcast-based coherency protocol) (see col. 18, lines 32-64).

In regard to claim 11, Cypher discloses wherein each of the first and second nodes comprises a respective processor having an associated cache that comprises a plurality of cache lines, each of the first and second nodes being programmed to facilitate interaction between the first protocol and the second protocol during migration of the ordering point from the cache of the second node to the cache of the first node (see col. 6, lines 28 through col. 7, line 4).

In regard to claims 12, 31, Cypher discloses a multi-processor computer system comprising: a home node provides at least one snoop to obtain a copy of a line of data in response to a request provided by a first processor in directory-based coherency protocol (see col. 10, lines 37-62), the home node reissues the at least one snoop when another copy of the line of data exists in the system associated with a broadcast-based protocol and no copy of the line of data is returned in response to the request provided by the first processor (see col. 10, lines 37-62), the another copy of the line of data being at least as up-to-date as the line of data in

memory associated with the home node (see col. 10, lines 37-62). But Sharma et al. do not specifically disclose a request provided by the first processor in a forward progress protocol.

In regard to claim 17, Cypher discloses wherein each of the home node and the first processor receives a response that includes a copy of the line of data to complete the request provided by the first processor (see col. 10, lines 37-62).

In regard to claim 32, Cypher discloses further providing a source broadcast request to the first processor for the data according to a broadcast-based protocol, the ordering point migrating in response to the source broadcast request for the data (see col. 10, lines 37-62).

In regard to claim 33, Cypher further discloses: providing an ownership data response from the first processor in response to the source broadcast request for the data (see col. 14, lines 50-67); and transitioning a state associated with the data at the first processor from an owner state to a transition state associated with the migration of the ordering point (see col. 14, lines 50-67).

In regard to claim 34, Cypher further discloses transitioning a state associated with the data at a second processor that provided the source broadcast request for the data in response to receiving the ownership data response, the second state defining the second processor as a new cache ordering point (see col. 14, lines 50-67).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-3 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Cypher in view of Martin et al. (US No. 6,883,070).

In regard to claim 2, Cypher discloses the claimed subject matter as discussed above rejection except the teaching of wherein the home node provides a retry request associated with the second request for the data in response to the conflict response from the second node. However Martin et al. disclose wherein the home node provides a retry request associated with the second request for the data in response to the conflict response from the second node (see col. 8, lines 26-33). Therefore, it would have been obvious to a person of an ordinary skill in the art at the time the invention was made to have combined the teachings of Martin et al. within the system of Cypher because it would provide an adaptive, hybrid protocol that is sensitive to the bandwidth available for communication of cache protocol messages.

In regard to claim 3, Martin et al. disclose wherein, in response to the retry request associated with the second request, the home node and the first node each receives a response that includes a copy of the data which completes the request for the data from the first node according to the first cache coherency protocol (see col. 8, lines 1-48). Therefore, it would have been obvious to a person of an ordinary skill in the art at the time the invention was made to have combined the teachings of Martin et al. within the system of Sharma et al. because it would

provide an adaptive, hybrid protocol that is sensitive to the bandwidth available for communication of cache protocol messages.

Allowable Subject Matter

8. Claims 19-24 are allowable over the prior of records.
9. Claims 4-7, 13-15, 18, 26-28, 35, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
10. The reason for allowance of claims 4-7, 13-15, 18-24, 26-28, 35 can be found in the previous Office Action.

Response to Amendment

10. Applicant's amendment and arguments, see 2-14, filed on March 13, 2006, with respect to the rejections of claims 1-3, 8-12, 16-17, 25, 29-34 under 35USC103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Cypher.

Conclusion

11. Claims 1-3, 8-12, 16-17, 25, 29-34 are rejected. Claims 4-7, 13-15, 18, 26-28, 35 are objected. Claims 19-24 are allowed.
12. The prior arts made of record and not relied upon are considered pertinent to applicant's disclosure.

Kagan et al. (US No. 5,301,298) disclose a processor for multiple cache coherency protocols.

Bryg et al. (US No. 6,049,851) disclose a method and apparatus for checking cache coherency in a computer architecture.

Shibata et al. (US No. 5,987,571) disclose a cache coherency control method and multi-processor system using the same.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Raymond Phan, whose telephone number is (571) 272-3630. The examiner can normally be reached on Monday-Friday from 6:30AM- 4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Primary, Paul Myers can be reached on (571) 272-3639 or via e-mail addressed to paul.myers@uspto.gov. The fax phone number for this Group is (571) 273-8300.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [raymond.phan@uspto.gov].


All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see [hop://pair-direct.uspto.gov](http://pair-direct.uspto.gov). Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 central telephone number is (571) 272-2100.

RP

Raymond Phan
May 11, 2006


MARK H. RINEHART
SUPERVISORY PATENT EXAMINER
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